

Claims

What is claimed is:

1. A predictive load management system comprising:  
a power source operable to generate a power output, the power source having a desired operating range;  
a transmission including a drive member operably engaged with the power source; and  
a control system in communication with the power source and the transmission, wherein the control system is operable to receive at least one input indicative of a load on the transmission, to identify a change in the load on the transmission based on the at least one input, to determine a desired power output of the power source to account for the change in the load on the transmission, and to modify a performance characteristic of the power source to cause the power source to generate the desired power output when the change in the load on the transmission will result in the power source operating outside of the desired operating range.
2. The predictive load management system of claim 1, wherein the control system comprises a first controller in communication with the power source and a second controller in communication with the transmission.
3. The predictive load management system of claim 1, further including a means for modifying the performance characteristic of the power source.
4. The predictive load management system of claim 1, wherein the power source includes:  
a turbocharger;  
a sensor operable to detect power source speed; and

a sensor operable to detect intake air pressure.

5. The predictive load management system of claim 4, further including at least one of a turbocharger compounding system, a turbocharger braking system, and an exhaust gas wasting system.

6. The predictive load management system of claim 1, wherein the performance characteristic includes at least one of a power source power and an intake air pressure.

7. The predictive load management system of claim 1, further including a fuel injection system operable to manipulate at least one of a fuel delivery rate, a fuel delivery timing, a fuel delivery pressure, and a delivered fuel quantity.

8. The predictive load management system of claim 1, wherein the transmission is a hydraulic continuously variable transmission including:

a variable displacement pump in communication with the control system;

a variable displacement motor fluidly connected to the variable displacement pump, the variable displacement motor being in communication with the control system; and

a sensor operatively disposed between the variable displacement pump and the variable displacement motor, the sensor operable to detect a change in a fluid pressure and to provide an indication of the change in fluid pressure to the control system.

9. The predictive load management system of claim 8, wherein the at least one input indicative of transmission loading includes at least one of:

a motor displacement signal; and

a transmission fluid pressure signal.

10. The predictive load management system of claim 1, wherein the transmission is an electric continuously variable transmission including:

a generator in communication with the control system; and  
a motor in communication with the control system and with the generator.

11. The predictive load management system of claim 10, wherein the at least one input indicative of the load on the transmission includes a transmission command torque signal as communicated between the control system and the motor.

12. The predictive load management system of claim 1, wherein the power source is a diesel engine.

13. A method of controlling a power source comprising:  
driving a transmission with a power source, the power source having a desired operating range;  
sensing a load on the transmission;  
identifying a change in the load on the transmission;  
determining a desired power output for the power source to account for the change in load on the transmission; and  
changing a performance characteristic of the power source to produce the desired power output when the change in the load on the transmission will result in the power source operating outside of the desired operating range.

14. The method of claim 13, wherein sensing a load on the transmission includes:

sensing a transmission fluid pressure differential between a supply conduit and a return conduit fluidly linking a pump and a motor in a hydraulic continuously variable transmission

15. The method of claim 13, wherein sensing a load on the transmission includes sensing a transmission motor displacement.

16. The method of claim 13, wherein sensing a load on the transmission includes sensing a torque command communicated to an electric motor in an electric continuously variable transmission.

17. The method of claim 13, further including adjusting the performance of an air induction system associated with the power source to thereby adjust the power output of the power source.

18. The method of claim 13, further including adjusting the performance of a fuel injection system associated with the power source to thereby adjust the power output of the power source.

19. A work machine having a predictive load management system comprising:

- a housing;

- a traction device supporting the housing;

- a power source operable to generate a power output, the power source having a desired operating range;

- a transmission including a drive member operably engaged with the power source and adapted to transmit the power output of the power source to the traction device; and

- a control system in communication with the power source and the transmission, wherein the control system is operable to receive at least one input indicative of a load on the transmission, to identify a change in the load on the transmission based on the at least one input, to determine a desired power output

of the power source to account for the change in the load on the transmission, and to modify a performance characteristic of the power source to cause the power source to generate the desired power output when the change in the load on the transmission will result in the power source operating outside of the desired operating range.

20. The work machine of claim 19, further including a means for modifying the performance characteristic of the power source.